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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 10/663,945
Filing Date: September 16, 2003
Appellant(s): CUSTY, EDWARD JOHN

Eric Anderson
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11/24/2006 appealing from the Office action mailed 08/02/2006.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| U.S. Patent No. 6,703,924 | Tecu et al. | 3-2004 |
| U.S. Patent No. 7,009,595 | Roberts et al. | 3-2006 |
| U.S. Patent No. 6,693,516 | Hayward | 2-2004 |
| U.S. Patent No. 6,354,839 | Schmidt et al. | 3-2002 |

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tecu et al (US 6,703,924) hereinafter Tecu in view of Roberts et al (US 7,009,595) hereinafter Roberts.

3. As to claim 1, Tecu teaches a tactile user interface device (a tactile display reads out information 10, fig. 1), comprising:

a substrate [a panel 12, see Fig. 1];

a plurality of tactile elements [a plurality of tactile elements 16.1 through 16.16, see Fig. 1, col. 2, lines 39-40] disposed on said substrate [the panel 12] wherein each of said plurality of tactile elements [plurality of tactile elements 16.1 through 16.16] correspond to at least a fraction of a pixel *[each of plurality of output element 16 correspond to a single pixel on the computer screen, see col. 2, lines 41-48]*; and

wherein each of said plurality of tactile elements [Fig. 1 is identical to Fig. 5, see col. 4, lines 5-6] comprises:

a pressure sensor disposed to indicate if any of said plurality of tactile elements has been depressed *[each of touch sensors 44 provides and output*

*responsive to a user's touch of the associated tactile output element; the touch sensors 44 comprise any kind of pressure responsive transducers, Fig. 5, col. 4, lines 24-26, and col. 4, lines 32-36];*

a feedback device disposed to convey tactile feedback information *[the touch sensors 44/transducers are energized by the user's touch causing the tactile display 42 to provide information, col. 5, lines 5-8; the drive system 30 is similar to those used to control tactile displays providing feedback, col. 3, lines 43-44].*

Accordingly, Tecu teaches all of the claimed limitation, except for a flexible membrane disposed on said plurality of tactile elements.

However, Roberts teaches a related Braille display device which including a flexible sheet 56/101 that puts on a plurality of tactile pins 21 [see figs. 8 and 13, col. 7,lines 42-65 for details of the explanation].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the flexible sheet 56 as taught by Roberts in the Braille display device of Tecu in order to achieve the benefit of providing a new refreshable tactile graphics display technology, high-speed repetitive scan, the depiction of moving pictures, while fabricating the Braille display device at low cost [see Roberts, col. 17, lines 48-58].

4. As to claim 7, Tecu teaches a tactile user interface device (a tactile display reads out information 10, fig. 1), comprising:

a planar substrate [a panel 12, see Fig. 1];

a plurality of pins [a plurality of tactile elements 16.1 through 16.16, see Fig. 1, col. 2, lines 39-40] disposed on said planar substrate [the panel 12] wherein each of said plurality of pins [plurality of tactile elements 16.1 through 16.16] correspond to a pixel, a fraction of a pixel, or a group of pixels on a video display [each of plurality of output element 16 correspond to a single pixel on the computer screen, a number of pixels grouped within a zone, a 200x150 array of tactile output elements 16 consistent with aspect ratio of the screen, see col. 2, lines 41-48]; and

wherein each of said plurality of pins [Fig. 1 is identical to Fig. 5, see col. 4, lines 5-6] comprises:

a pressure sensor disposed to indicate if any of said plurality of tactile elements has been depressed *[each of touch sensors 44 provides and output responsive to a user's touch of the associated tactile output element; the touch sensors 44 comprise any kind of pressure responsive transducers, Fig. 5, col. 4, lines 24-26, and col. 4, lines 32-36];*

a feedback device disposed to convey tactile feedback information *[the touch sensors 44/transducers are energized by the user's touch causing the tactile display 42 to provide information, col. 5, lines 5-8; the drive system 30 is similar to those used to control tactile displays providing feedback, col. 3, lines 43-44].*

Accordingly, Tecu teaches all of the claimed limitation, except for a flexible membrane disposed on said plurality of pin elements.

However, Roberts teaches a related Braille display device which including a flexible sheet 56/101 that puts on a plurality of tactile pins 21 [see figs. 8 and 13, col. 7,lines 42-65 for details of the explanation].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the flexible sheet 56 as taught by Roberts in the Braille display device of Tecu in order to achieve the benefit of providing a new refreshable tactile graphics display technology, high-speed repetitive scan, the depiction of moving pictures, while fabricating the Braille display device at low cost [see Roberts, col. 17, lines 48-58].

5. The limitation of claim 14 is similar to those of claim 1, though in method form, therefore the rejection of claim 14 will be treated using the same rationale as claim 1.

6. Claims 1-5, 7-14 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Hayward (US 6,693,516).

7. As to claim 14, Hayward teaches a method of fabricating a tactile user interface device (figs. 5G, 5H and 5I, col. 10, line 20), comprising steps of:

fabricating a substrate [a layer of a printed circuit board 73, col. 10, line 15-21];

disposing a plurality of tactile elements on said substrate [pressure sensors 95 sandwiched between the contactor array 90 and the printed circuit board 73, col. 10, lines 16-18] wherein each of said tactile element [the contactor array 90] comprises:

a pressure sensor disposed to determine if any of said plurality of tactile elements has been depressed [pressure sensors 95, col. 10, line 20-21; a finger 8, fig. 2D, col. 5, line 55 for further details of the alternative embodiment];

disposing a flexible membrane [76] on said plurality of tactile elements [70, 77]

disposing a flexible membrane [76] plurality of microelectromechanical devices [70, 77] disposed to convey tactile feedback information, wherein each of said microelectromechanical devices [70, 77] corresponds to one of said tactile elements [a reversible transducer employs bi-directional tactile information is relayed to and from a user and a computer, col. 11, lines 32-66 for further details of the explanation].

8. The limitation of claims 1 and 7 are similar to those of claim 14, though in apparatus form, therefore the rejection of claims 1 and 7 will be treated using the same rationale as claim 14.

9. As to claim 2, Hayward teaches wherein each of said pressure sensors is a mechanical switch (see fig. 2F, col. 6, lines 25-30) comprising contactors 25 and 26 (pins, fig. 2F, col. 6, line 59 through col. 7, line 6), are processed by the small movement in a Z direction. The small movements in the Z directions are also measured and transducer in a signal Z (t) (col. 7, lines 12-19); whenever the Z(t) exceeds the event signaling threshold, yet another specific tap sequence may be experience by the user (col. 7, lines 34-44).

10. As to claim 3, Hayward teaches wherein each of said pressure sensor is a mechanical switch [actuators 52 operate in the d31 or d11 mode, see col. 8, lines 28-31].

11. As to claim 4, Hayward teaches wherein each of said pressure sensor is a piezoelectric sensor [the piezo-electric actuators 52, see col. 8, lines 1-15].

12. As to claim 5, Hayward teaches wherein said tactile feedback information includes vibrations [vibrotactile sensations, and heat expansion actuators, see col. 3, line 5, and col. 5, lines 40-45].

13. Claim 8 shares the same limitations as those of claim 2 and therefore the rationale for rejection will be the same.

14. Claim 9 shares the same limitations as those of claim 3 and therefore the rationale for rejection will be the same.

15. Claim 10 shares the same limitations as those of claim 4 and therefore the rationale for rejection will be the same.

16. As to claim 11, Hayward teaches wherein each of said feedback devices is disposed to position said plurality of pins to a plurality of positions [see fig. 2E].

17. Claim 12 shares the same limitations as those of claim 5 and therefore the rationale for rejection will be the same.

18. As to claim 13, Hayward teaches wherein each of said feedback device is an electromagnet [a variety of devices may be employed as motive sources, including magnetostrictive actuators, col. 3, lines 1-6].

19. As to claim 16, Hayward teaches wherein said substrate contains at least a portion of any control circuitry for said tactile user interface device [a layer of a printed circuit board 73, col. 10, line 15-21].

20. As to claim 17, Hayward teaches wherein said substrate contains any required control circuitry and any associated circuitry required for said tactile user interface

device [a layer of a printed circuit board 73, and the circuit 73 controls the said tactile display device, col. 10, line 15-21 for further details of the operation].

21. As to claim 18, Hayward teaches wherein each of said feedback devices [said tactile feedback device] is disposed on said flexible membrane 76 [see paragraph 7 of claim 14 above for more details].

22. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayward in view of Schmidt et al (US 6,354,839) hereinafter Schmidt.

Hayward teaches all of the claimed limitation of claim 1, except wherein each of said feedback device comprises at least one microelectromechanical device has at least two mechanical states.

However, Schmidt teaches the tactile user interface device (a Braille display device 2 is a feedback device, see fig. 1, col. 7, line 43) comprising at least one microelectromechanical device (MEMs 16, fig. 3). The MEMs device 16 has the actuator 28 operating to open and close the MEMs device 16 (corresponding to two mechanical states as claimed, col. 5, lines 50-58).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the microelectromechanical device operating to open and close as taught by Schmidt in the tactile user interface device of Hayward in order to achieve the benefit of provide a refreshable display that allows a user to access links or subdirectories without removing their hands from the Braile display surface (Schmidt, col. 3, lines 9-12), quickly and easily assembled or repaired (Schmidt, col. 3, line 18),

eliminate any interference and prevent damage to underlying display hardware (Schmidt, col. 3, lines 27-30).

**(10) Response to Argument**

A. Ground of Multiple references rejection:

Appellant argues that "insufficient to make out to establish a prima facie case rejection". In response, Examiner respectfully disagrees because a prima facie case of obvious is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. Once such a case is established, it is incumbent upon appellant to go forward with objective evidence of unobviousness. See In re Fielder, 471 F.2d 640, 176 USPQ 300 (CCPA 1973). See In re Palmer, 172 USPQ 126 (CCPA 1971). See In re Reven, 156 USPQ 679 (CCPA 1968).

Although the invention is not identically disclosed or described as set forth in 35 U.S.C.102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a designer of ordinary skill in the art to which said subject matter pertains, the invention is not patentable.

This modification of the primary reference in light of the secondary reference is proper because the applied references are so related that the appearance of features shown in one would suggest the application of those features to the other. See *In re Rosen*, 673 F.2d 388, 213 USPQ 347 (CCPA 1982); *In re Carter*, 673 F2d 1378, 213 USPQ 625 (CCPA 1982), and *In re Glavas*, 230 F.2d 447, 109 USPQ 50 (CCPA 1956).

Further, it is noted that case law has held that one skilled in the art is charged with knowledge of the related art; therefore, the combination of old elements, herein, would have been well within the level of ordinary skill. See *In re Antle*, 444 F.2d 1168, 170 USPQ 285 (CCPA 1961) and *In re Nalbandian*, 661 F.2d 1214, 211 USPQ 782 (CCPA 1982).

When the reference relied on expressly anticipates or makes obvious all of the elements of the claimed invention, the reference is presumed to be operable. Once such a reference is found, the burden is on appellant to provide facts rebutting the presumption of operability. In re Sasse, 629 F.2d 675, 207 USPQ 107 (CCPA 1980). See also MPEP § 716.07.

Where, however, the specification is silent as to what constitutes equivalents and the examiner has made out a prima facie case of equivalence, the burden is placed upon the appellant to show that a prior art element which performs the claimed function is not an equivalent of the structure, material, or acts disclosed in the specification. See In re Mulder, 716 F.2d 1542, 1549, 219 USPQ 189, 196 (Fed. Cir. 1983). If the appellant disagrees with the inference of equivalence drawn from a prior art reference, the appellant may provide reasons why the appellant believes the prior art element should not be considered an equivalent to the specific structure, material or acts disclosed in the specification. Such reasons may include, but are not limited to: (A) Teachings in the specification that particular prior art is not equivalent; (B) Teachings in the prior art reference itself that may tend to show nonequivalence; or (C) 37 CFR 1.132 affidavit evidence of facts tending to show nonequivalence.

In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

B. Ground of Tecu in view of Roberts rejection:

Appellant argues the combination of Tecu and Roberts fails to teach with respect to claims 1 and 7 recited "a tactile user interface device, comprising: a pressure sensor disposed to indicate if any of said plurality of tactile elements have been depressed, a feedback device disposed to convey tactile feedback information, a pixel corresponding to a fraction of a pixel, and flexible membrane." In response, the examiner respectfully disagrees. As stated supra with respect to claims 1 and 7, the examiner found that Tecu teaches a pressure sensor disposed to indicate if any of said plurality of tactile elements have been depressed *(each of touch sensors 44 provides and output responsive to a user's touch of the associated tactile output element; the touch sensors 44 comprise any kind of pressure responsive transducers, Fig. 5, col. 4, lines 24-26, and col. 4, lines 32-36);* a feedback device disposed to convey tactile feedback information *(the touch sensors 44/transducers are energized by the user's touch causing the tactile display 42 to provide information, col. 5, lines 5-8; the drive system 30 is similar to those used to control tactile displays providing feedback, col. 3, lines 43-44);* and as stated infra with respect to claims 1 and 7, the examiner finds that Tecu teaches each of sixteen tactile output elements 16 less than 800x600 pixel screen in col. 2, lines 38-46. And as stated

supra with respect to claims 1 and 7, the examiner found that Roberts teaches a flexible sheet 56/101 that puts on a plurality of tactile pins 21, see figs. 8 and 13, col. 7,lines 42-65.

Appellant argues Tecu's supplemental tactile display is separated device: it is not integrated into each of Tecu's tactile output elements. In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., a feedback device is integrated into each tactile element) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, Tecu teaches it would have been obvious that they may be combined or integrated into a single unit in col. 3, lines 55-64 of Tecu.

In response to appellant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the examiner provides the motivation for doing so would reduce in contamination of the internal components of the display by dirt and other substances introduce from the fingers and by environment exposure, col. 13, lines 32-35 of Roberts.

Appellant argues the combination of Tecu and Roberts fails to teach with respect to claim 14 further recited limitation "the flexible membrane is sandwiched between the tactile elements and a plurality of microelectromechanical (MEM) device." In response, the examiner respectfully agrees. The rejection of claims 14 and 16-18 based on the combination of Tecu and Roberts is withdrawn.

C. Ground of Hayward rejection:

Appellant argues with respect to claims 1 and 7 recited "a tactile element comprising a pressure sensor, a feedback device, and each tactile element corresponds to a fraction of a pixel" In response, the examiner respectfully disagrees. As stated infra, the examiner finds that Hayward teaches a tactile display device comprising a tactile element 25, and a feedback device, e.g., a visual or audio feedback, dual function, bi-directional tactile information in fig. 2F, col. 6, line 59—col. 7, line 44, col. 10, lines 55-65, col. 11, lines 32-35, and col. 11, line 62—col.12, line 8. And Hayward teaches a tactile display device comprising a tactile element 25, each tactile element 25 in which areas in a transducer have more resolution than others in an effort to reduce the total number of actuators in col. 9, lines 26-37.

Appellant argues Hayward fails to teach with respect to claim 14 further recited limitation "the flexible membrane is sandwiched between the tactile elements and a plurality of microelectromechanical (MEM) device." In response, the examiner respectfully agrees. The rejection of claims 14 and 16-18 based on Hayward is withdrawn.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections of claims 1-13 should be sustained.

Respectfully submitted,

Kevin M. Nguyen
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Conferees:

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